WHAT IS CLAIMED IS:

1. An image encoding apparatus comprising:

a converter for receiving an image signal, and for carrying out orthogonal transformation on a block by block basis of an image frame to convert the image signal of individual blocks to DC components and AC components;

a predicted reference value generator for receiving the image signal, and for generating a predicted reference value of each image frame from individual DC components obtained by orthogonal transformation of left-edge blocks of the image frame; and

a differential unit for obtaining difference values between the DC components output from said converter and the predicted reference value generated by said predicted reference value generator, wherein

said image encoding apparatus carries out quantizing and variable-length encoding of the AC components and the difference values obtained by said differential unit, carries out quantizing and variable-length encoding of the predicted reference value to be added to a header, and outputs as a bit stream.

2. The image encoding apparatus according to claim 1, wherein said predicted reference value generator generates the predicted reference value of each image frame by obtaining an average value, mode or median of the DC components of the left-edge blocks of the image frame.

3. The image encoding apparatus according to claim 1, wherein said predicted reference value generator generates the predicted

reference value of a present image frame from the individual DC components resulting from orthogonal transformation of left-edge blocks of a past image frame or future image frame.

4. An image encoding apparatus comprising:

a converter for receiving an image signal, and for carrying out orthogonal transformation on a block by block basis of an image frame to convert the image signal of individual blocks to DC components and AC components;

a predicted reference value generator for receiving the image signal, and for generating a predicted reference value of each image frame from individual DC components obtained by orthogonal transformation of left-edge blocks of the image frame;

a predicted value selector for obtaining difference values between the DC components output from said converter and the predicted reference value generated by said predicted reference value generator, for obtaining difference values between the DC components output from said converter and a neighboring predicted value which is a DC component of an immediately previous block passing through the conversion by said converter, for selecting, when obtaining the difference values with a smaller number of bits in the case of quantizing and encoding the two difference values, one of the predicted reference value and neighboring predicted value as a predicted value, and for generating a flag indicating which one of the predicted reference value and neighboring predicted value is selected as the predicted value; and

a differential unit for obtaining difference values between the DC components output from said converter and the predicted value selected by said predicted value selector, wherein

said image encoding apparatus carries out quantizing and variable-length encoding of the AC components and the difference values obtained by said differential unit, carries out quantizing and variable-length encoding of the predicted reference value to be added to a header together with the flag, and outputs as a bit stream.

5. The image encoding apparatus according to claim 4, wherein said predicted reference value generator generates the predicted reference value of each image frame by obtaining an average value, mode or median of the DC components of the left-edge blocks of the image frame.

6. The image encoding apparatus according to claim 4, wherein said predicted value selector generates the flags of the individual blocks by selecting the predicted value for each of the individual blocks.

7. The image encoding apparatus according to claim 4, wherein said predicted value selector generates the flags of individual macroblocks by selecting the predicted value for each of the individual macroblocks, each consisting of a plurality of blocks.

8. The image encoding apparatus according to claim 4, wherein said predicted value selector generates the flags of individual regions by selecting the predicted value for each of the individual regions such as a slice or object.

9. The image encoding apparatus according to claim 4, wherein said predicted reference value generator generates the predicted

reference value of a present image frame from the individual DC components resulting from orthogonal transformation of left-edge blocks of a past image frame or future image frame.

10. An image encoding apparatus comprising:

a converter for receiving an image signal, and for carrying out orthogonal transformation on a block by block basis of an image frame to convert the image signal of individual blocks to DC components and AC components;

a predicted reference value generator for receiving the image signal, and for generating a predicted reference value of each of regions from individual DC components obtained by orthogonal transformation of left-edge blocks of the regions such as a slice and object of the image frame; and

a differential unit for obtaining difference values between the DC components output from said converter and the predicted reference value generated by said predicted reference value generator, wherein

said image encoding apparatus carries out quantizing and variable-length encoding of the AC components and the difference values obtained by said differential unit, carries out quantizing and variable-length encoding of the predicted reference value to be added to a header, and outputs as a bit stream.

11. The image encoding apparatus according to claim 10, wherein said predicted reference value generator generates the predicted reference value of each of the regions of a present image frame from the individual DC components resulting from orthogonal transformation of left-edge blocks of the regions of a past image frame or future image frame.

12. An image encoding apparatus comprising:

a converter for receiving an image signal, and for carrying out orthogonal transformation on a block by block basis of an image frame to convert the image signal of individual blocks to DC components and AC components;

a predicted reference value generator for receiving the image signal, and for generating a predicted reference value of each of regions from individual DC components obtained by orthogonal transformation of left-edge blocks of the regions such as a slice and object of the image frame;

a predicted value selector for obtaining difference values between the DC components output from said converter and the predicted reference value generated by said predicted reference value generator, for obtaining difference values between the DC components output from said converter and a neighboring predicted value which is a DC component of an immediately previous block passing through the conversion by said converter, for selecting, when obtaining the difference values with a smaller number of bits in the case of quantizing and encoding the two difference values, one of the predicted reference value and neighboring predicted value as a predicted value, and for generating a flag indicating which one of the predicted reference value and neighboring predicted value is selected as the predicted value; and

a differential unit for obtaining difference values between the DC components output from said converter and the predicted value selected by said predicted value selector, wherein

said image encoding apparatus carries out quantizing and variable-length encoding of the AC components and the difference

values obtained by said differential unit, carries out quantizing and variable-length encoding of the predicted reference value to be added to a header together with the flag, and outputs as a bit stream.

13. The image encoding apparatus according to claim 12, wherein said predicted value selector generates the flags of the individual blocks by selecting the predicted value for each of the individual blocks.

14. The image encoding apparatus according to claim 12, wherein said predicted value selector generates the flags of individual macroblocks by selecting the predicted value for each of the individual macroblocks, each consisting of a plurality of blocks.

15. The image encoding apparatus according to claim 12, wherein said predicted value selector generates the flags of individual regions by selecting the predicted value for each of the individual regions such as a slice or object.

16. The image encoding apparatus according to claim 12, wherein said predicted reference value generator generates the predicted reference value of each of regions of a present image frame from the individual DC components resulting from orthogonal transformation of left-edge blocks of the regions of a past image frame or future image frame.

17. An image decoding apparatus comprising:

a variable-length decoder for decoding difference values and AC components of individual blocks contained in a bit stream,

and for decoding a predicted reference value of each image frame generated from DC components of left-edge blocks of the image frame added to a header; and

an adder for obtaining the DC components by adding the difference values and the predicted reference value, which are decoded by said variable-length decoder, wherein

said image decoding apparatus outputs a decoded image signal by carrying out dequantization and inverse orthogonal transformation of the AC components and the DC components obtained by said adder.

18. An image decoding apparatus comprising:

a variable-length decoder for decoding difference values and AC components of individual blocks contained in a bit stream, and for decoding a predicted reference value of each of regions generated from DC components of left-edge blocks of the regions such as a slice and object of an image frame added to a header; and

an adder for obtaining the DC components by adding the difference values and the predicted reference value, which are decoded by said variable-length decoder, wherein

said image decoding apparatus outputs a decoded image signal by carrying out dequantization and inverse orthogonal transformation of the AC components and the DC components obtained by said adder.

19. An image decoding apparatus comprising:

a variable-length decoder for decoding difference values and AC components of individual blocks contained in a bit stream, for decoding a predicted reference value of each image frame

generated from DC components of left-edge blocks of the image frame added to a header, and for decoding flags of the individual blocks, which indicate which one of the predicted reference value and neighboring predicted value of an immediately previous block is selected as a predicted value added to a header;

a predicted value decision unit for making a decision from the flags as to which one of the predicted reference value and the neighboring predicted value is selected as the predicted value, and for outputting the selected one of the predicted reference value and the neighboring predicted value as the predicted value; and

an adder for obtaining the DC components by adding the difference values decoded by said variable-length decoder and the predicted value fed from said predicted value decision unit, wherein

said image decoding apparatus outputs a decoded image signal by carrying out dequantization and inverse orthogonal transformation of the AC components and the DC components obtained by said adder.

20. An image decoding apparatus comprising:

a variable-length decoder for decoding difference values and AC components of individual blocks contained in a bit stream, for decoding a predicted reference value of each of regions generated from DC components of left-edge blocks of the regions such as a slice and object of an image frame added to a header, and for decoding flags of the individual blocks, which indicate which one of the predicted reference value and neighboring predicted value of an immediately previous block is selected as a predicted value added to a header;

a predicted value decision unit for making a decision from the flags as to which one of the predicted reference value and the neighboring predicted value is selected as the predicted value, and for outputting the selected one of the predicted reference value and the neighboring predicted value as the predicted value; and

an adder for obtaining the DC components by adding the difference values decoded by said variable-length decoder and the predicted value fed from said predicted value decision unit, wherein

said image decoding apparatus outputs a decoded image signal by carrying out dequantization and inverse orthogonal transformation of the AC components and the DC components obtained by said adder.